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GEOLOGIC MAP AND SECTIONS OF THE THIRSTY CANYON SE QUADRANGLE, NYE COUNTY, NEVADA

By

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PREPARED IN COOPERATION WITH THE U.S. ATOMIC ENERGY COMMISSION

Base by U.S. Geological Survey, 1961

Geology mapped in 1964

DESCRIPTION OF MAP UNITS

Phenocrysts listed in order of decreasing abundance

Qac **ALLUVIUM AND COLLUVIUM** (0-100+ ft)--unconsolidated gravel, sand, and silt; locally cemented with caliche.

QTgs **GRAVELS AND TUFFACEOUS SEDIMENTS** (0-400+ ft)--slightly consolidated light-tan to gray lithic sandstone and bouldery gravel; includes tuffaceous beds.

QTby **YOUNGER BASALT LAVA FLOW** (20-50 ft)--dark-brown to black.

THIRSTY CANYON TUFF (40-340 ft)--alkali quartz latitic and rhyolitic ash-flow tuff; commonly includes 5-30 percent phenocrysts of alkali feldspar, quartz, and biotite. Thickness 400+ ft.

tt **TRAIL RIDGE MEMBER** (20-100 ft)--simple cooling unit of ash-flow tuff; moderately welded crystallized red- to orange-brown upper part (**tta**) grades down to moderately welded glassy gray lower part (**ttl**); scoriaceous inclusions throughout. Includes 5-10 feet pale-orange to white pumiceous air-fall tuff at base.

SPEARHEAD MEMBER (40-300 ft)--composite sheet of ash-flow tuff that coalesce to south and west into one compound cooling unit; also includes basal unit of mainly nonwelded ash-flow tuff. Subunits mapped (40-250 ft)--

tsw **Compound cooling unit**; gray nonwelded to densely welded tuff including depositional equivalents of upper part (**tsu**), unit 3 of lower part (**tsl$_3$**), and unit 2 of lower part (**tsl$_2$**). Commonly includes 10-30 feet densely welded, red-brown, crystalline, prominent cliff former, gray at top; grades down to moderately welded gray-brown slope-forming middle zone (**tsl$_2$**, equivalent) with scattered pumice lapilli. Locally includes 1-5 feet densely welded pale red-brown or purple-brown lower zone (**tsl$_2$** equivalent) with thin slightly welded glassy base.

tsu **Upper part**; gray nonwelded to densely welded units; gray partly welded crystallized top grades down to moderately to densely welded crystalline red-brown interior; gray glassy base nonwelded to partly welded. Black scoriaceous inclusions. Locally includes 1-5 feet densely welded tuff at base.

Lower part:

tsl$_3$ **Unit 3** (40 ft)--simple cooling unit; gray nonwelded glassy top grades down to densely welded red-brown crystallized welded crystallized base. Good parting in places at base.

tsl$_2$ **Unit 2** (40 ft)--simple cooling unit; mostly crystalline, moderately welded, pale red-brown or purple-brown, in places glassy at top and base; grades down to densely welded interior. Locally includes 1-5 feet bedded tuff at base.

tsl$_1$ **Unit 1** (0-150 ft)--1 to 5 nonwelded to slightly welded flow units 10 feet to 50 feet thick. Proportion of ash-flow to bedded tuff variable, mapped as bedded tuff (**t**) where more than 50 percent bedded.

t **UNDIFFERENTIATED BEDDED TUFF** (0-400? ft)--air-fall and reworked tuff; local nonwelded ash flow tuff, sandstone, and conglomerate.

bo **OLDER BASALT LAVA FLOW** (0-100 ft)--dark-brown to black.

TRACHYANDESITE LAVA FLOWS (100+ ft)--dark-gray to black; top grade locally into bedded tuff. Flaky flow-layered brown bases.

yau UPPER FLOW (70 ft).

yal LOWER FLOW (30+ ft).

cr **TUFF OF CUTOFF ROAD** (100-200 ft)--simple cooling unit; rhyolitic ash flow tuff. Moderately welded crystalline gray-tan upper part grades down to gray or light-pink nonwelded glassy base. Sparse pumice; 5 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite.

TIMBER MOUNTAIN TUFF:

AMMONIA TANKS MEMBER:

matu Upper part (0-300 ft)--simple cooling unit; densely welded quartz latitic ash flow tuff. Red-brown, crystalline where thick, with large black flame near base; where thinner, base is black crystalline with white eutaxitic pumice. Cobble-size lithic inclusions common; 20 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite, clinopyroxene.

matl Lower part (30-150 ft)--simple cooling unit; rhyolitic ash-flow tuff. Densely welded, pale red-brown or purple-brown, crystalline; grades down to gray glassy nonwelded base. Lithic inclusions uncommon; 20 percent phenocrysts of alkali feldspar, quartz, plagioclase, biotite, clinopyroxene.

TUFF OF CAMP TRANSVAAL:

mtu Upper part (100-500 ft)--mostly nonwelded or slightly welded gray or lavender-gray glassy and crystalline rhyolitic ash-flow tuff; a medium part of tan densely welded crystalline ash-flow tuff is scattered through upper part in angular-pebble- to cobble-size lenticular bodies 10 feet to 50 feet thick. Proportion of ash-flow to bedded tuff variable, mapped as bedded tuff (**t**) where more than 50 percent bedded.

mtl Lower part (0-150 ft)--simple cooling unit; densely welded quartz latitic ash flow tuff. Separate flow units 10-20 feet thick, locally separated by partings or bedded tuffs. Interflingering bedded tuffs most abundant near base; mapped as bedded tuff (**t**) where more than 50 percent bedded. Lithic inclusions in lithic inclusions; 15 percent phenocrysts of alkali feldspar, quartz, plagioclase, and biotite.

TUFF OF CAT CANYON:

mg Upper part (100-500 ft)--multiple-flow compound cooling unit; crystallized ash-flow tuff. Upper part red-brown densely welded quartz latite with 20 percent phenocrysts of plagioclase, alkali feldspar, quartz, biotite, clinopyroxene. Lower part of nonwelded rhyolite with numerous small purple lithic inclusions and 15 percent phenocrysts of alkali feldspar, quartz, plagioclase, biotite. Thin air-fall tuff at base.

mf Lower (1,500+ ft)--compound cooling unit; crystallized ash-flow tuff:

mf$_2$ Nonwelded to slightly welded zone (250+ ft)--light-brown to gray nonwelded rhyolitic ash-flow tuff with numerous small lithic inclusions. 25 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite.

mf$_1$ Upper part (150 ft)--densely welded, separately only where upper part grades down to E; mapped as undistinguished.

Lower part (0-100 ft)--present except at east-central edge of quadrangle.

me Welded zone E (300+ ft)--brown and red-brown moderately to densely welded quartz latite. Numerous small lithic inclusions in upper part. 35 percent phenocrysts of alkali feldspar, plagioclase, biotite, quartz, clinopyroxene. Lower contact is color gradation to welded zone D (**md**).

md$_2$ Upper part (10-75 ft)--mapped where lower part of nonwelded to slightly welded zone (**md$_1$**) present.

md$_1$ Lower part (100+ ft)--densely welded, red-brown, distinctive white eutaxitic pumice. 30 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite, clinopyroxene.

mc Welded zone C (1,000+ ft)--moderately to densely welded blue-gray to purple-brown rhyolite. 30 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite, clinopyroxene. Lower contact is color gradation to welded zone A (**ma**).

ma Welded zone A (500+ ft)--moderately to densely welded, gray- to brown-ripple, upper part is rhyolite having 20 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite; grades down to quartz latite having 30 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite, clinopyroxene. Lower part moderately welded, red brown, dense, crystallized, and otherwise altered. About 30 percent phenocrysts of alkali feldspar, plagioclase, quartz, biotite, clinopyroxene. Upper part (400 ft) densely welded and gray where unaltered; red brown and dense where silicified and crystallized into middle zone (**mrcm**).

mrcm Middle zone (150-250 ft)--densely welded, red-brown, distinctive white eutaxitic pumice; as much as 1 foot long; gradational contacts.

mrcl Lower zone (300+ ft)--upper part red-brown, dense, crystalline; moderately welded; in lower part eutaxitic texture inconspicuous or absent, apparently only slightly welded. Base not exposed.

RHYOLITE AND LATITE LAVA FLOWS:

rb **RHYOLITE OF BEATTY WASH** (300+ ft)--flow-layered light-gray to pale-red-brown rhyolite; top bleached or dark-green to porphyritic yellow where zeolitized.

rc **RHYOLITE OF WEST CAT CANYON** (100-500 ft)--flow-layered light-gray and purple-red rhyolite; black or dark green gray top and base.

la **LATITE** (100+ ft)--gray to red-brown.

RHYOLITE LAVA FLOWS:

rv **RHYOLITE** (0-300 ft)--flow-layered, light-gray, crystalline, containing black or gray-green vitrophyre near top and base, grades outward into zeolitized yellow tuffaceous flow-breccia.

ry **RHYOLITE** (50+ ft)--flow-layered, crystalline, contains 5 per cent phenocrysts of alkali feldspar, plagioclase, magnetite, biotite, amphibole.

bl **LANDSLIDE BRECCIA** (0-350 ft)--mostly massive nonstratified heterolithologic breccia of Brown welded tuff with little or no matrix.

Contact--*Dashed where approximately located; short dashed where gradational*

Fault, showing dip--*Dashed where approximately located, dotted where concealed; queried where hypothetical. Bar and ball on downthrown side*

Strike and dip of beds

Horizontal beds

Strike and dip of foliation or flow layering

Horizontal foliation or flow layering

Vertical shaft

Adit

Prospect

Map of the western part of the Nevada Test Site showing approximate boundary of the Timber Mountain caldera and location of the Thirsty Canyon SE quadrangle